Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC

GN Docket No. 14-28

In the Matter of

Protecting and Promoting the Open Internet

The Telecom Act of 1996 *Requires* the FCC to Classify Commercial Internet Access as a Telecommunications Service

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Thousands of papers and comments have been written about what Open Internet policies would best serve the public interest, and thousands more have been written about whether better Open Internet policies could be supported by calling Internet access a telecommunications service under Title II of the Communications Act or an information service. Even the authors of this comment have written about these topics.[1][2][3] However, this particular comment will address neither of these topics. Instead, it will consider only whether or not commercial Internet access is or is not a telecommunications service under current law. Although many issues are delegated to the FCC as an expert agency, the FCC is still required to follow the laws passed by Congress and signed by the President, and the FCC's discretion has bounds. In this matter, we find that the Communications Act of 1934 as modified by the Telecommunications Act requires the FCC to define commercial Internet access as a telecommunications service. Opinions will differ as to whether this is a good or bad result for the future of the Internet, but this question is outside the scope of this comment.

1. Classification of "Telecommunications Services" is Based on Two Types of Functionality

There are two types of functionality relevant to classification of a service as a "telecommunications service" under the Communications Act of 1934, as amended by the Telecommunications Act of 1996. They are *technical functionality* and *commercial functionality*.

1.1 Technical Functionality

Title I, II, III, and VI services – as readily seen from the statutory definitions of telecommunications, broadcasting, cable, mobile, and information – differ by the technical functionality as to what is offered. Of relevance here, "telecommunications" is defined in terms of its technical functionality as "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received" (47 U.S.C. §153(43)). Whereas, "information service" is defined in terms of its technical functionality as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service" (47 U.S.C. §153(20)). Importantly, this definition of an information service has two components - technical functions that must exist as well as technical functions that are specifically excluded. Moreover, given these definitions, the FCC has interpreted telecommunications and information service to be mutually exclusive, based on their differences in technical functionality.[4]

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[1] J. M. Peha, "A 'Most Favored Nation' Approach to an Open Internet," Comments in the Matter of Protecting and Promoting the Open Internet, Federal Communications Commission GN Docket No. 14-28, July 15, 2014. http://users.ece.cmu.edu/~peha/Peha_Open_Internet_July_2014.pdf

[2] J. M. Peha, "The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy," *Telecom Policy Research Conf.*, 2006, and *International Journal of Communication*, 2007. http://users.ece.cmu.edu/~peha/balanced_net_neutrality_policy.pdf

[3] B. A. Cherry, J. Mailland, "Towards Sustainable Network-Openness Obligations on Broadband in the U.S. : Surviving Providers' First Amendment Challenges," *Telecom Policy Research Conf.*, 2014. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2417758

[4] In the Matter of Federal-State Joint Board on Universal Service, CC Docket No. 96-45, Report to Congress, 13 FCC Rcd 11501 (1998) ("*Universal Service Report*").

1.2 Commercial Functionality

Under the Act, "The term "telecommunications service" means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public regardless of the facilities used" (47 U.S.C. §153(46)). Thus, a "telecommunications service" is defined in terms of *two* components of functionality – a technical functionality component and a commercial functionality component. First, a telecommunications service must offer the underlying technical functionality of "telecommunications". Second, a telecommunications service must offer this technical functionality through a specific commercial means: "for a fee directly to the public, or to such classes of users as to be effectively available directly to the public regardless of the facilities used." This commercial functionality component is the basis for distinguishing between common carriage and private carriage of telecommunications.[5] Importantly, commercial functionality of "telecommunications service" does not require the existence of monopoly or an assessment of market structure.

1.3 The FCC's Authority in Determining Commercial Functionality

When the technical functionality of telecommunications is provided, a further distinction is required based on commercial functionality, that is, whether telecommunications is provided on a common carriage or private carriage basis.

As explained in *NARUC I*,[6] "[w]hat appears to be essential to the quasi-public character implicit in the common carrier concept is that the carrier 'undertakes to carry for all people indifferently'" (525 F.2d at 641, footnote omitted). However, since both common carriers and private carriers may serve the same clientele, the distinction between them turns on the manner and terms by which they approach and deal with their customers.

> The cases make clear both that common carriers need not serve the whole public, and that private carriers may service a significant clientele, apart from the carrier himself. Since given private and common carriers may therefore be indistinguishable in terms of the clientele actually served, *it is difficult to envision a sensible line between them which does not turn on the manner and terms by which they approach and deal with their customers.* The common law requirement of holding oneself out to serve the public indiscriminately draws such a logical and sensible line between the two types of carriers" (*NARUC I,* 525 F.2d at 642, footnotes omitted, emphasis added).

Given the nature of this line-drawing between common and private carriers, *NARUC I* explains that commercial functionality is determined under the following scenarios.

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[5] Similarly, "mobile service" is composed of the underlying technical functionality defined in 47 U.S.C. §153(27), and section 332 differentiates between commercial mobile service and private mobile service.

[6] National Association of Regulatory Utility Commissioners v. FCC, 525 F.2d. 630 (D.C. Cir. 1976) ("*NARUC I*").

1.3.1 Nondiscretionary Classification

Classification of a telecommunications offering as common carriage or private carriage is based on assessment of how the service is offered. This is not a discretionary classification by the FCC.

> [*W*]*e reject those parts of the [FCC's] Orders which imply an unfettered discretion in the Commission to confer or not common carrier status on a given entity, depending upon the regulatory goals it seeks to achieve.* The common law definition of common carrier is sufficiently definite as not to admit of agency discretion in the classification of operating communications entities. A particular system is a common carrier by virtue of its functions, rather than because it is declared to be so (*NARUC I,* 525 F2d at 644, emphasis added, footnotes omitted).

1.3.2. Reclassification When Circumstances Change

The classification of the service can change over time as the manner and terms by which the carriers approach and deal with their customers change.

> We therefore conclude that nothing in the record indicates any significant likelihood that SMRS will hold themselves out indifferently to serve the user public. While it is undisputed that they would be permitted so to hold themselves out if they desired, that is not sufficient basis for imposing the burdens that go with common carrier status. *In so holding, we do not foreclose the possibility of future challenge to the Commission's classification, should the actual operations of SMRS appear to bring them within the common carrier definition* (*NARUC I,* 525 F2d at 643-644, emphasis added).

In fact, SMRS providers have since been reclassified as common carriers when they interconnect with the public switched network and give subscribers the capability to communicate to or receive communication from all other users on the public switched network (47 CFR §20.3).

1.3.3 Discretionary Classification

Even if the classification of the service as currently offered is private carriage, the FCC has the discretion to require that it be provided on a common carriage basis.

> The statements of the [FCC] Order can be made to square with the view of this court, if they are read to mean that the Commission could have treated SMRS as common carriers by imposing on them requirements which would have made them common carriers. Without asserting that this was the Commission's meaning, *it is clear that the Commission had discretion to require SMRS to serve all potential customers indifferently, thus making them common carriers within the meaning of the statute*" (F2d at 644 n. 76, emphasis added).

The *Computer Inquiry* framework, under which telephone companies were required to provide "basic service" to unaffiliated enhanced service providers on a common carriage basis, is an example of the FCC exercising such discretion.

2. Service Definitions

This section shows that if one applies the statutory definitions that are mandated by the Communications Act of 1934, as amended by the Telecommunications Act of 1996, commercial Internet access services as they are offered today are "telecommunications services", and not "information services". In this regard, the underlying technical functionality of IP Packet Transfer *is* telecommunications, and the commercial offering of Internet access service *is* a telecommunications service. Indeed, modern Internet access services fit the definition of telecommunications service established by Congress at least as well as commercial telephone services based on traditional circuit-switched technology, if not better. Moreover, legally, this classification is not discretionary.

2.1 IP Packet Transfer *is* Telecommunications

The fundamental service of the Internet is the transfer of one or more Internet Protocol (IP) packets from sender to intended recipient. In that process, a packet may pass through multiple networks, each of which is providing an IP Packet Transfer service of its own.

> ***A network provides IP Packet Transfer when it transfers IP packets from an ingress point that is receiving IP packets from the sender to an egress point that can send IP packets to the intended recipient.***

Restated here, below is the definition of "telecommunications".

> The term "telecommunications" means the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

It is clear that IP Packet Transfer means transmission of information that is of the packet sender's choosing, since the sender chooses what information to put in each packet. Moreover, it is the nature of IP Packet Transfer that the "form and content of the information" is precisely the same when an IP packet is sent by the sender as when that same packet is received by the recipient. These are both consistent with the above definition.

The one remaining issue, whether IP Packet Transfer occurs "between or among points specified by the user," is more complicated, although only slightly so. In each IP packet, the sender places the IP address of the packet's intended recipient. In some cases, the sender knows the recipient's IP address already, and in some cases the sender must first look up the desired IP address. Either way, communications is clearly to a point specified by the user sending the packet. For that portion of traffic for which the packet's sender and intended recipient are both customers of the same Internet access provider, that is the entire story. However, the Internet is a network of networks, and this is not always the case. Consider the case where an IP packet travels through several networks before reaching its destination. Collectively, these networks are sending the packet to the point specified by the sender. Individually, each network is sending the packet to an egress point that the network has determined is en route to the point specified by the user. This is essentially the same as long-distance calls in the traditional telephone network, where information travels through a local exchange carrier, and then a long-distance carrier, and then another local exchange carrier, and each of these carriers is still said to provide telecommunications. Thus, the same must be said of IP Packet Transfer.

Note that the analysis above assumed only that a network used IP from ingress to egress. As a result, this analysis is applicable to a wide range of networks. The Internet is based on a layered design. Underneath the IP layer, there may be a variety of physical infrastructure types, including fiberoptic cable, twisted pair copper, and wireless, as well as a variety of link-layer protocols, including DOCSIS, PPPoE, and LTE. On top of the IP layer, there can be a variety of transport protocols, including TCP, UDP, and home-grown proprietary protocols, as well as a variety of applications, including voice over IP (VOIP), web browsing, and video streaming. None of this influences our analysis. In today's Internet, the IP protocol is used to transfer information from ingress point to egress point, and IP Packet Transfer meets the legal definition of telecommunications regardless of the layers above or below. This includes when IP Packet Transfer is used for web browsing over a wired network and when it is used for video streaming over a wireless network.

2.2 A Commercial Internet Access Service *Is* a Telecommunications Service

Restated for convenience here is the definition of "telecommunications service".

> The term "telecommunications service" means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

By definition, a commercial Internet access service is offered "for a fee directly to the public, or to such classes of users as to be effectively available directly to the public." Internet access services vary somewhat from one Internet access provider to another, but the core offering is IP Packet Transfer which is telecommunications, as shown in Section 2.1. It is IP Packet Transfer that subscribers are seeking when they sign up for an ISP. Other functions of an Internet Access Provider are separable from the core offering, done only in support of the core offering, or both.

A prominent example is electronic mail. E-mail is an information service. At the time when the FCC and Supreme Court were making decisions about what constituted a telecommunications service in the wake of the 1996 Telecommunications Act, it may have seemed that e-mail was a crucial component of any Internet access service. E-mail was the original "killer app." Today, most Americans get their email from separate application service providers such as Google, Microsoft, and Yahoo, or from their employers or schools. While most Internet access providers do provide e-mail as well, it is clear that if they choose not to, the Internet Access Providers' customers will simply go elsewhere for this service. E-mail is not an essential part of a commercial Internet access service. It is easily separable, and whether an Internet access provider chooses to offer an e-mail service should not be considered when determining whether the Internet access service is a telecommunications or information service.

A similar but more subtle example is support for use of the Domain Name System (DNS). DNS is the global directory service that allows users to map human-readable names such as "www.fcc.gov" into IP addresses. These IP addresses can then be placed in the header of an IP packet, so that the IP Packet Transfer system can send the packet to its intended recipient. It is common for Internet access providers to place resolvers with caches in their network to facilitate this function for subscribers. IP Packet Transfer does work just as well without DNS, but it is less useful, just as a telephone system is less useful without a phone book. Here are three reasons why an Internet access

service does not become an information service simply because it includes DNS. First, it is separable. At the time of these FCC and Supreme Court decisions, it was probably difficult to imagine that an ISP could exist that did not play a role in helping its subscribers make DNS queries. However, we all know better today. DNS support can easily be separated from IP Packet Transfer, and today some Internet users turn to Application Service Providers (such as Google) for this service rather than to their Internet access provider. Second, even when offered by the Internet Access Provider, this DNS capability is clearly only there in support of the core function of IP Packet Transfer, which is telecommunications. According to the Telecommunications Act of 1996, even a function that might otherwise be an information service will not be considered as such if it is merely used "for the management, control, or operation of a telecommunications system or the management of a telecommunications service," which is clearly the case here. Third, for the purposes of categorization, there is little difference between DNS support offered by an Internet access Provider and the 411 directory service offered by many providers of telephone service. Both allow a user to discover how to reach another party. Both are extraneous but useful conveniences offered to supplement a telecommunications service. No one argued that telephone companies were not providing a telecommunications service because they offered 411. Thus, DNS support should not be considered when determining whether commercial Internet access providers offer a telecommunications service or an information service.

Internet access providers also typically assign IP addresses to their customers, either on a static or dynamic basis. This process is important because it makes it unlikely that two end points will ever adopt the same address, a situation that would cause problems for both the network and the end users. This is similar to the assignment of telephone numbers in the telephone network. Most telephone users get a new telephone number by requesting it from their telephone provider. In some cases, users ask their new telephone provider to determine whether the user can regain rights to a phone number the user had once before with a previous provider, but this still requires coordination with the new phone company. Static IP addresses could be assigned in a similar manner, with Internet access providers assigning addresses when service begins. For users who want their IP addresses assigned on a dynamic basis, there is a difference in that they (or their devices) typically learn about the assignment from a server operated by the Internet access provider using a protocol called DHCP, rather than some slow out-of-band communications such as when an employee of the telephone company tells a new customer her new phone number in a phone conversation. This difference is not consequential; other systems that offer telecommunications services also operate servers that provide important information dynamically in a similar manner. For example, a cell phone can request information from nearby towers about geographic location, or whether a phone call through those towers would incur roaming charges. Moreover, once again, management of IP addresses and making assignment information available via DHCP is merely information management in support of a telecommunications service, namely IP Packet Transfer, just as management of telephone numbers is.

2.3 A Commercial Internet Access Service *Is Not* an Information Service

Finally, restated here is the definition of "information service":

> The term "information service" means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.

In IP Packet Transfer, packets are moved from sender to recipient without any change in format or content, and this can be done without offering any of the things that the Telecommunication Act of 1996 says must be part of an information service. Merely transferring a packet to its intended recipient does not by itself involve generating, acquiring, transforming, processing, retrieving, utilizing, or making available information. Of course, it is possible to make use of IP Packet Transfer to acquire information or to make information available, just as it is possible to make use of telephone calls to acquire information or make information available. For example, services have emerged whereby telephone users can call a given information provider to hear prerecorded messages with anything from sports scores to daily prayers. This does not change the fact that a commercial Internet access service and a commercial telephone service are both telecommunications services according to the Telecommunications Act of 1996. IP Packet Transfer involves storage only in the sense that each packet can be queued at any router until it is the packet's turn to be transmitted by that router. However, this ephemeral storage of a packet while in transit is not a storage service. Indeed, users would much prefer that their packets spend as little time as possible in buffers waiting to be transmitted. It cannot reasonably be said that Internet access providers are providing the service of storing packets any more than the Department of Motor Vehicles (DMV) is providing the service of storing humans merely because there are sometimes humans at the DMV waiting to be served.

There are some functions that are common if not required in a commercial Internet Access Provider that do involve "generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information." In addition to those already described in Section 2.2, commercial Internet access providers may want information systems for account management and billing, for configuration management, for the monitoring of failures and other state information, and to keep track of which addresses are reachable through each of the interconnected neighboring networks. All of these fall within the exception of "use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service" as explicitly defined in the 1996 Telecommunications Act. They are also not very different from functions in the telephone system, and the existence of these functions did not make telephony an information service.

Many Internet Access Providers also provide true information services as defined in the Telecommunications Act of 1996 merely to supplement their telecommunications service, but not as an integral part of that telecommunications service. Examples include e-mail and news sites, both of which are easily separable from Internet access. These companies may also lease customer premises equipment (CPE), or sell t-shirts. None of this matters when determining whether commercial Internet access services are telecommunications or information services.

3. Conclusion

Under the statutory definitions of the Communications Act of 1934, as amended by the Telecommunications Act of 1996, commercial Internet access service *is* a telecommunications service. It satisfies the two components of functionality – the technical functionality of telecommunications, and the commercial functionality of common carriage. This applies to all commercial Internet access services that employ IP Packet Transfer, which includes both wireless and wired networks. Moreover, having satisfied these two forms of functionality, classification of commercial Internet access service as a telecommunications service is legally required and not a matter of FCC discretion. Finally, even if there was dispute as to whether the commercial functionality component is satisfied, the FCC does have the discretion to require provision on a common carriage basis.

Although the law requires the FCC to consider commercial Internet access service as a telecommunications service, the Telecommunications Act of 1996 does provide the FCC the authority to forbear from the enforcement of certain regulations and provisions of the Communications Act of 1934. In contrast to the determination of service classification as a telecommunications service, the FCC's exercise of such forbearance power does require assessment of competitive market conditions. Whether the FCC should impose regulations or forbear is outside the scope of this comment.